

Abstract Submitted
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High Pressure Synthesis and properties of (Ca,Pr)Fe₂As₂¹ TYLER DRYE, Center for Nanophysics and Advanced Materials, Department of Physics, Univ of Maryland-College Park, VALENTIN TAUFOR, UDHARA KALU-ARACHCHI, SHENG RAN, PAUL CANFIELD, Ames Lab, Department of Physics, Iowa State University, JOHNPIERRE PAGLIONE, Center for Nanophysics and Advanced Materials, Department of Physics, Univ of Maryland-College Park — Despite impressively high superconducting transition temperatures approaching 50 K, superconductivity in rare earth-doped CaFe₂As₂ appears to only involve a small volume fraction as determined by shielding fraction. In addition, the amount of Pr that can be doped into the system via ambient pressure flux synthesis is limited to <15%, due to a width of formation limitation. We report a study using high-pressure flux growth to substitute higher levels of Pr approaching 40% concentration. The superconducting properties of the resultant crystals are presented, including chemical composition, resistivity, and magnetization measurements. The final result is a complete phase diagram for the Pr-doped CaFe₂As₂ system.

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